

LD

Notice of Allowability	Application No.	Applicant(s)	
	10/664,555	LIU, JIA-CHU	
	Examiner	Art Unit	
	Ling-Siu Choi	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

- 1. ☒ This communication is responsive to Preliminary Amendment.
- 2. ☒ The allowed claim(s) is/are 26-33.
- 3. ☐ The drawings filed on _____ are accepted by the Examiner.
- 4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 - 1. ☐ Certified copies of the priority documents have been received.
 - 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

- 5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 - 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
- 7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>09/18/2003</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

1. This Office Action is in response to the Preliminary Amendment filed September 18, 2003. Claims 1-25 were canceled and claims 26-33 have been added. Claims 26-33 are now pending, wherein claims 26-33 are drawn to a process to polymerize an olefin.
2. This Application is a Division of US Application Serial No. 09/716,954, filed November 21, 2000, now US Patent No. 6,660,678 B1.

Examiner's Amendment

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CAR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Jonathan L. Schuchardt on February 17, 2005.

4. The application has been amended as follows:

In the Specification, under the title, change "filed November 21, 2000" to --filed November 21, 2000, now U.S. Patent No. 6,660,678 B1--;

Claim 26, line 10, change "transition metal" to --transition metal (M)--;

Art Unit: 1713

Claim 30, line 10, change "transition metal" to --transition metal (M)--.

Allowable Subject Matter

5. Claims 26-33 are allowed.

6. The following is an examiner's statement of reasons for allowance:

The present claims are allowable over the closest references: Etherton et al. (US 5,539,124).

A process to polymerize an olefin in the presence of an catalyst system comprising

A	an activator
B	an organometallic complex - containing mixture:
	(a) deprotonating a compound [indole, carbazole, 8-quinolinol, 2-pyridinol, and mixtures thereof] with an alkyllithium compound to produce an anionic ligand precursor
	(b) reacting the anionic ligand precursor with a Group 4 transition metal (M) tetrahalide at greater than about 10°C in a hydrocarbon solvent to produce an organometallic complex-containing mixture

(summary of claim 26)

Etherton et al. disclose a process to polymerize an olefin in the presence of a catalyst comprising (a) a compound having the general formula of $[L]_m-M([Cp]_q)([B]_p)-[Y]_n$ or $[L]_m-M-[X]_{4-m}$, wherein L is a ligand containing an **indolyl** or **carbazolyl** group; M is selected from the group consisting of titanium, zirconium, and mixtures thereof; Cp is a ligand containing

Art Unit: 1713

a cyclopentadienyl group; B is a Lewis acid; Y is selected from the group consisting of halogen, alkoxy, siloxy, $N(R_1)_2$, and mixtures thereof; X is halogen; and m is 2-4 and (b) alumoxane (Example 1; claims 1, 6, 7, 11, and 15). Etherton et al. further disclose that the compound is obtained by deprotonation of indole or carbazole with **methyl magnesium bromide** in ether and then contact of the resulting mixture with a transition metal compound at 0°C and then room temperature to form the compound (col. 4, lines 56-67; col. 5, lines 1-39; Example 1). In comparing Example 1 with Comparative Examples 5 and 10 (Table 1), the results are shown as following

	Catalyst	Activity (kg/g Zr/hr)	MWD
Example 1	bis(carbazolyl)Zr complex	150	2.49
Comparative Example 5	bis(carbazolyl)Zr complex*	18	3.12
Comparative Example 10	bis(carbazolyl)Zr complex*	12	3.15

* the catalyst is made according to Etherton et al. (US 5,539,124)

These results clearly show that the catalyst made according to the disclosure of Etherton et al. is different from one made according to the present invention. Thus, Etherton et al. do not teach or fairly suggest a process to polymerize an olefin in the presence of the same catalyst as claimed in the present invention.

In light of the above discussion, it is evident as to why the present claims are patentable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the

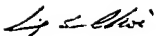
Art Unit: 1713

payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on 571-272-1114.



**LING-SUI CHOI
PRIMARY EXAMINER**

February 15, 2005